

WHAT IS CLAIMED IS:

1. An intercalated clay comprising a clay intercalated with a block copolymer wherein said block copolymer comprises a hydrophilic block capable of intercalating said clay.

2. The clay of claim 1 wherein said block copolymer further comprises a block that does not intercalate clay.

3. The clay of claim 1 wherein said block copolymer further comprises a block comprising an oleophilic polymer.

4. The clay of claim 1 wherein said hydrophilic block comprises at least one member selected from the group consisting of poly(alkylene oxide), poly 6, (2-ethyloxazolines), poly(ethyleneimine), poly(vinylpyrrolidone), poly(vinyl alcohol), polyacrylamides, polyacrylonitrile, polysaccharides and dextrans.

5. The clay of claim 1 wherein said hydrophilic block comprises poly(ethylene oxide).

6. The clay of claim 1 wherein said hydrophilic block comprises polysaccharide.

7. The clay of claim 1 wherein said hydrophilic block comprises polyvinyl pyrrolidone.

8. The clay of claim 2 wherein said block that does not intercalate clay consists of at least one member selected from the group consisting of polycaprolactone, polypropiolactone, poly β -butyrolactone; poly δ -valerolactone;

poly ϵ -caprolactam; polylactic acid; polyglycolic acid; polyhydroxybutyric acid; derivatives of polylysine; and derivatives of polyglutamic acid, polymers of α , β -ethylenically unsaturated monomers.

9. The clay of claim 2 wherein said block that does not intercalate clay comprises polyester.

10. The clay of claim 2 wherein said block that does not intercalate clay comprises polycaprolactone.

11. The clay of claim 2 wherein said block that does not intercalate clay comprises polyamide.

12. The clay of claim 2 wherein said block that does not intercalate clay comprises polystyrene.

13. The clay of claim 1 wherein said clay comprises smectite clay.

14. The clay of claim 1 wherein said clay comprises synthetic smectite clay.

15. The clay of claim 1 wherein said clay comprises layered double hydroxide clay.

16. An article comprising a matrix polymer and clay wherein said clay is intercalated with a block copolymer, wherein said block copolymer comprises a hydrophilic block capable of intercalating said clay and a matrix compatible block compatible with said matrix polymer.

17. The article of claim 16 wherein said hydrophilic block comprises at least one member selected from the group consisting of poly(alkylene oxide), poly 6, (2-ethyloxazolines), poly(ethyleneimine), poly(vinylpyrrolidone), poly(vinyl alcohol), polyacrylamides, polyacrylonitrile, polysaccharides and dextrans.

18. The article of claim 16 wherein said hydrophilic block comprises polyethylene oxide.

19. The article of claim 16 wherein said hydrophilic block comprises polysaccharide.

20. The article of claim 16 wherein said hydrophilic block comprises polyvinyl pyrrolidone.

21. The article of claim 16 wherein said matrix compatible block consists of at least one member selected from the group consisting of polycaprolactone, polypropiolactone, poly β -butyrolactone; poly δ -valerolactone; poly ϵ -caprolactam; polylactic acid; polyglycolic acid; polyhydroxybutyric acid; derivatives of polylysine; and derivatives of polyglutamic acid, polymers of α , β -ethylenically unsaturated monomers.

22. The article of claim 16 wherein said matrix compatible block comprises polyester.

23. The article of claim 16 wherein said matrix compatible block comprises polycaprolactone.

24. The article of claim 16 wherein said matrix compatible block comprises polyamide.

25. The article of claim 16 wherein said matrix compatible block comprises polystyrene.

26. The article of claim 16 wherein said clay comprises smectite clay.

27. The article of claim 16 wherein said clay comprises synthetic smectite clay.

28. The article of claim 16 wherein said clay comprises layered double hydroxide clay.

29. The article of claim 16 wherein said block copolymer comprises three blocks.

30. The article of claim 16 wherein said block copolymer comprises two blocks.

31. The article of claim 16 wherein said block copolymer comprises three blocks and said matrix comprises a copolymer compatible with at least one block of said block copolymer.

32. The article of claim 16 wherein said block copolymer comprises three blocks and said matrix comprises a blend of polymers compatible with at least one block of said block copolymer.

33. The article of claim 32 wherein individual polymers in the blend of copolymers are compatible with separate blocks of said block copolymers.

35. The article of claim 16 wherein said matrix compatible block comprises 25 to 100 monomer repeat units of ethylene and said matrix polymer comprises polyethylene.